CLAIMS

WE CLAIM:

1. A method of inducing lysis of proliferating cancer cells comprising contacting said cells with a vaccinia virus having an inactivating mutation in an interferon resistance gene.

2. The method of claim 1, wherein the cancer cells are ras-transformed cells.

3. The method of claim 1, wherein the cancer cells are breast cancer cells or prostate cancer cells.

4. The method of claim 1, wherein the inactivating mutation is in a gene selected from the group consisting of E3L, K3L, or a combination thereof.

5. The method of claim 4, wherein the inactivating mutation is selected from the group consisting of a deletion mutation, a substitution mutation, and a missense mutation.

6. The method of claim 4, wherein the inactivating mutation is in the E3L gene.

7. The method of claim 6, wherein the mutation is a deletion of the whole E3L gene.

8. The method of claim 1, wherein the mutant vaccinia virus has a reduced ability to inhibit PKR and increased sensitivity to interferon.

9. The method of claim 1, wherein said contacting comprises administering a therapeutic amount of the vaccinia virus to a mammal comprising proliferating cancer cells under conditions that permit contact between the vaccinia virus and the proliferating cancer cells.

10. The method of claim 9, wherein the administering is selected from the group consisting of intratumoral injection, intravenous injection, and intravascular injection.

11. A therapeutic composition for use in targeted cell lysis of a proliferating cancer cell comprising a vaccinia virus having an inactivating mutation in an interferon resistance gene and a carrier.

12. The therapeutic composition of claim 11, wherein the target cell is a breast cancer cell or prostate cancer cell.

13. The composition of claim 12, wherein the inactivating mutation is in a gene selected from the group consisting of E3L, K3L, or a combination thereof.

14. The composition of claim 13, wherein the inactivating mutation is selected from the group consisting of a deletion mutation, a substitution mutation, and a missense mutation.

15. The composition of claim 13, wherein the inactivating mutation is in the E3L gene.

16. The composition of claim 15, wherein the mutation is a deletion of the whole E3L gene.